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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/077,029	05/18/1998	MUTSUMI KIMURA	JAO40499	5555
25944	7590	09/10/2004		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER SCHECHTER, ANDREW M	
			ART UNIT 2871	PAPER NUMBER

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/077,029

Applicant(s)

KIMURA ET AL.

Examiner

Andrew Schechter

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2004 10 July 2004 AS
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19, 32, 50, 51 and 53-65 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-8, 12-14, 18, 50, 51 and 53-65 is/are rejected.
- 7) ☒ Claim(s) 4, 9-11, 15-17, 19 and 32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/20/02, 7/31/03, 2/11/04, 6/6/04, 6/21/04,
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Objections***

2. Claim 14 is objected to because of the following informalities: "removal of the material" should be "removal of part of the material". Appropriate correction is required.
3. Claim 15 is objected to because of the following informalities: "the coated display substrate" lacks an appropriate antecedent, so it should be "a coated display substrate". Appropriate correction is required.
4. Claim 51 is objected to because of the following informalities: "being lower in height one between the features and the peripheries" should be "being the one of the features and the peripheries of the features which is lower in height". Appropriate correction is required.
5. Applicant is advised that should claims 50, 64, and 65 be found allowable, claims 57, 58, and 59, respectively, will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 50, 51, and 56-65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claims 1, 50, 60, and 61 recite the limitation "there not being a starting material for forming the features at the predetermined positions" or equivalent. This is unclear. First, the specification does not appear to discuss a "starting material" so there is no guidance as to what this limitation means. Second, it can be interpreted in multiple ways: 1) the starting material for the features is not at the predetermined positions, 2) the features are formed in one step without an intermediate "starting material" being placed down, 3) the features are not made of any material, but instead are defined as the absence of another material (such as ITO, for instance), etc. What is applicant's understanding of this limitation? For examining purposes, it is assumed that the second interpretation above is the one intended by the applicant.

Claims 51, 56-59, and 62-65 depend on the above claims.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 5, 7, 50, 51, 57-59, 61, 62, 64, and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Yuichi*, Japanese Patent Document No. 06-281917 in view of *Leupp et al.*, U.S. Patent No. 3,863,332.

Regarding claim 61, *Yuichi* discloses [see Fig. 1] a display device comprising an optical material [5] arranged at predetermined positions defined by features [6] on an object [3] comprising a display substrate, there not being a starting material for forming the features at the predetermined positions [see above discussion under 35 U.S.C. 112].

*Yuichi* discloses that the invention may be applied to an active-matrix device [paragraph 0030], but does not explicitly disclose that there are scanning lines and signal lines. *Leupp et al.* discloses an active-matrix device having scanning and signal lines [22, 24], and it would have been obvious to one of ordinary skill in the art at the time of the invention to use such lines in the device of *Yuichi*, motivated by the necessity of doing so to control the pixels using a transistor-based active matrix arrangement, which obtains high display quality. Claim 61 is therefore unpatentable.

Similarly, *Leupp* discloses switching elements [26], so claim 62 is also unpatentable.

Regarding claims 1 and 50, there is the additional claim limitation that the predetermined positions are defined by features of which repellency to a solution of the optical material or a precursor of the optical material is substantially different from that

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of peripheries of the features. *Yuichi* discloses this limitation, since the partition walls [6] have a different repellency than the peripheries (in this case the flat surface 2 made of a transparent conductive film where the optical material is placed) [see abstract, etc.]. Claims 1 and 50 are therefore unpatentable as well.

The predetermined positions are the one of the features and the peripheries of the features which is lower in height, so claim 51 is also unpatentable. The features are projections which surround the optical material, so claim 64 is also unpatentable.

Regarding claim 65, *Yuichi* does not explicitly disclose scanning and signal lines, so it does not disclose them being below the projections. *Leupp* does disclose the scanning and signal lines, and it does disclose them being between analogous projections [33] in its device. It would have been obvious to one of ordinary skill in the art at the time of the invention to do so in the device of *Yuichi*, motivated by the desire to maximize the contrast ratio and display quality. (Both the projections and the scanning and signal lines are in the non-pixel, non-display part of the substrate, which does not contribute to the image, so superimposing them minimizes the non-display region and improves the display quality.) Claim 65 is therefore unpatentable.

As above, *Leupp* teaches using scanning and signal lines, the features in *Yuichi* are projections surrounding the optical material, and it would have been obvious to one of ordinary skill in the art at the time of the invention to form the scanning and signal lines below the projections as disclosed by *Leupp*, so claims 57-59 are also unpatentable.

Considering claims 5 and 7, *Yuichi* and *Leupp* disclose the method of making the device described above, with first and second bus lines (scanning and signal lines), features of which the repellency to an optical material in a liquid or a liquid precursor of the optical material is different from that of the peripheries of the features so that the features define predetermined positions, with a difference in height between the features and the predetermined positions defined by the features formed, and applying an optical material or the liquid precursor to the surface where the features are formed. Claims 5 and 7 are therefore unpatentable as well.

10. Claims 56 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Yuichi*, Japanese Patent Document No. 06-281917 in view of *Leupp et al.*, U.S. Patent No. 3,863,332 as applied to claims 1 and 62 above, and further in view of *Noguchi*, U.S. Patent No. 4,781,438.

*Yuichi* and *Leupp* do not explicitly disclose that the transistors used as switching elements are thin film transistors (TFTs). *Noguchi* discloses using TFTs in an analogous device, and it would have been obvious to one of ordinary skill in the art at the time of the invention to do so in the above device, motivated by *Noguchi's* teaching that an "active-matrix liquid crystal display panel using thin film field effect transistors (hereinafter, referred to TFT) as switches has been recognized, in recent years, as preferable to image a fine high quality color image" [col. 1, lines 15-19]. Claims 56 and 63 are therefore unpatentable.

11. Claims 5, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Yuichi*, Japanese Patent Document No. 06-281917 in view of *Yamazaki et al.*, U.S. Patent No. 5,821,138.

Considering claim 8, *Yuichi* discloses a method of manufacturing a display device comprising disposing an optical material or a precursor of the optical material at predetermined positions defined by features formed on an object including a display substrate. *Yuichi* does not disclose the remaining limitations of claim 8.

*Yamazaki* does disclose the remaining limitations: forming a layer to be transferred, including a plurality of scanning lines [110, etc.] and signal lines [117, etc.], pixel electrodes [118] and switching elements [112-115, etc.], for controlling the pixel electrodes, on a peeling layer [102] formed on a peeling substrate [101], and transferring the layer to be transferred another object with liquid crystal therebetween [see Fig. 4]. Applied to *Yuichi*, the analogous object for the peeled layer to be transferred to is the object coated by the optical material or the precursor shown in Fig. 2e [the optical material 5 is analogous to the liquid crystal 125, and the electrode 2 is analogous to the electrode 123]. It would have been obvious to one of ordinary skill in the art at the time of the invention to do so, motivated by *Yamazaki*'s teaching that this method has advantages such as promoting crystallization of silicon while restraining production costs [col. 8, lines 12-14] or making a substrate which is flexible [col. 1, lines 10-13]. Claim 8 is therefore unpatentable.

When the first and second bus lines are the scanning and signal lines of *Yamazaki*, the above-described method satisfies the limitations of claim 5 and 6 as well.



*Yuichi* discloses forming the features with differing repellencies, predetermined positions, and height differences, and applying an optical material. As above, *Yamazaki* discloses forming a layer to be transferred, with second bus lines, on a peeling layer and transferring it to the surface coated with the optical material, and it would have been obvious to one of ordinary skill in the art at the time of the invention to do so as discussed above. Claims 5 and 6 are therefore unpatentable.

12. Claims 2, 3, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ogata*, Japanese Patent Document No. 59-75205 in view of *Kashiwazaki et al.*, U.S. Patent No. 5,552,192.

*Ogata* discloses [see abstract, Figs. 1-4] a method of manufacturing a display device comprising forming features [2 or the wells between 2] of which repellency to an optical material in a liquid is substantially different from that of peripheries of the features on an object [1] comprising a display substrate so that a difference in height between the features and predetermined positions defined by the features is formed, and applying the optical material to the surface where the features are formed by an ink jet method.

It might be argued that *Ogata* discloses a color filter substrate rather than a display substrate. *Kashiwazaki* discloses [see Fig. 3] an analogous color filter substrate which is used as a display substrate in an LCD. It would have been obvious to one of ordinary skill in the art at the time of the invention to do so, motivated by the commercial value added by incorporating the color filter into a display device. Claim 2 is therefore unpatentable.

Taking the features to be the recesses between projections 2, they are less repellent to the optical material compared to the peripheries of the features [meaning the projections 2], and the optical material is disposed with the surface facing upward, so claim 3 is also unpatentable.

When completed, the feature height is equal to the optical material thickness, so claim 18 is also unpatentable.

13. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ogata*, Japanese Patent Document No. 59-75205 in view of *Kashiwazaki et al.*, U.S. Patent No. 5,552,192 as applied to claim 2 above, and further in view of *Won*, U.S. Patent No. 5,400,157.

*Ogata* does not disclose an interlayer insulation film. *Won* discloses [see Fig. 2] an interlayer insulation film [6]; it would have been obvious to one of ordinary skill in the art at the time of the invention to use one in the device of *Ogata*, motivated by the desire to protect the color filters and light shielding layers from the ITO, and vice versa. Claim 12 is therefore unpatentable.

*Ogata* does not disclose that the features comprise a light shielding layer. *Won* discloses [see Fig. 2] features [2] in an analogous location between color filter pixels which serve as a light shielding layer; it would have been obvious to one of ordinary skill in the art at the time of the invention to do so with the features in the device of *Ogata*, motivated by the desire to provide light shielding (improve contrast and aperture ratio) with a layer which is already present in the device. Claim 13 is therefore unpatentable.

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14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Ogata*, Japanese Patent Document No. 59-75205 in view of *Kashiwazaki et al.*, U.S. Patent No. 5,552,192, and further in view of *Matsuyama et al.*, U.S. Patent No. 5,831,701.

*Ogata* does not disclose the features being formed by applying a liquid material and then removing part of it. *Matsuyama* discloses [see Fig. 8] making an analogous feature [BM, a black matrix for a color filter substrate] by applying a liquid material and then removing part of it. It would have been obvious to one of ordinary skill in the art at the time of the invention to do so to make the features in *Ogata*, motivated by such a spin-coating and patterning method being conventional and well-understood, thus avoiding production difficulties, and producing a black matrix with "increased light shielding ability" [col. 11, line 33]. Claim 14 is therefore unpatentable.

15. Claims 53-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Ogata*, Japanese Patent Document No. 59-75205 in view of *Kashiwazaki et al.*, U.S. Patent No. 5,552,192, and further in view of *Noguchi*, U.S. Patent No. 4,781,438.

*Ogata* does not explicitly disclose forming scanning lines, signal lines, and switching elements that are TFTs. *Noguchi* does disclose forming scanning lines, signal lines, and switching elements that are TFTs in an analogous device, and it would have been obvious to one of ordinary skill in the art at the time of the invention to form these active matrix elements on an active matrix substrate and pair it with *Ogata*'s color filter substrate, motivated by *Noguchi*'s teaching that an "active-matrix liquid crystal display panel using thin film field effect transistors (hereinafter, referred to TFT) as switches has

been recognized, in recent years, as preferable to image a fine high quality color image” [col. 1, lines 15-19]. Claims 53-55 are therefore unpatentable.

***Allowable Subject Matter***

16. Claims 4, 9-11, 15-17, 19, and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

17. Claim 60 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

18. The following is a statement of reasons for the indication of allowable subject matter:

The prior art does not disclose the device of claim 4, in particular the limitations that the features are projections less repellent to the optical material compared to the peripheries, and the optical material is disposed by ink jet method with the surface facing downward. Claim 4 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 9, in particular the additional limitation that the features comprise at least one of the bus lines. Claim 9 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claims 10 or 11, in particular the additional limitation that the features comprise wiring including scanning lines or signal lines or comprise pixel electrodes. Claims 10 and 11 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 15, in particular the additional limitation of forming a layer to be transferred including the features on a peeling layer disposed on a peeling substrate and transferring the layer onto a coated display substrate or the display substrate. Claim 15 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 16, in particular the additional limitation that the liquid optical material is thinner than the surface feature height. Claim 16 would therefore be allowable if rewritten appropriately, as would claim 17 which depends on it.

The prior art does not disclose the device of claim 19, in particular the additional limitation that the recited limitation relating the driving voltage and surface features to the electric field strength (which is not relevant for a color filter substrate such as *Ogata's*). Claim 19 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 32, in particular the additional limitation of enhancing lyophilicity at the predetermined locations relative to the peripheries. Claim 32 would therefore be allowable if rewritten appropriately.

The prior art does not disclose the device of claim 60, in particular the limitations that the optical material is arranged at predetermined positions defined by differing repellency on an object comprising a display substrate, first bus lines, and second bus lines (hence not a color filter substrate such as *Ogata's*), and that it is arranged by ink jet method (hence not *Yuichi* or *Tadafumi's* methods, which involve spreading the liquid

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crystal rather than using an ink jet method). Claim 60 would therefore be allowable if rewritten appropriately, including addressing the rejection under 35 U.S.C. 112.

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Japanese Patent Document No. 07-134288 to *Tadafumi* discloses, very similar to *Yuichi*, an LCD having features which differ in repellency to the optical material from the peripheries of the features.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Schechter whose telephone number is (571) 272-2302. The examiner can normally be reached on Monday - Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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September 1, 2004